

CLAIMS

1. A transmission device comprising:

5 a non-linear distortion compensating section for compensating non-linear distortion of an orthogonal base-band signal digitally modulated by using non-linear distortion compensating data which compensates the non-linear distortion;

10 a first orthogonal modulator for orthogonally modulating the orthogonal base-band signal undergone the non-linear distortion compensation;

a modulation signal distributor for distributing a modulation signal formed by amplifying a signal orthogonally modulated by the first orthogonal modulator;

15 a phase/amplitude control section for controlling a phase and an amplitude of at least one of a distributed signal distributed by the modulation signal distributor and a reference signal based on the orthogonal base-band signal;

20 a signal combiner for combining a combinatory signal based on the distributed signal and the reference signal at least one of which signals phase and amplitude are controlled by the phase/amplitude control section; and

25 a reference table updating section for updating the non-linear distortion compensating data based on the combinatory signal combined by the signal combiner and undergone analog-digital conversion and the orthogonal base-band signal.

2. The transmission device of claim 1,

wherein the phase/amplifier control section controls a phase and an amplitude of the distributed signal, and the reference signal is generated by a second orthogonal modulator which generates a reference modulation signal by orthogonally modulating the orthogonal base-band signal,

wherein the reference table updating section updates the non-linear distortion compensating data by using the orthogonal base-band signal and one of a demodulated signal obtained by an orthogonal demodulator which orthogonally demodulates the combinatory signal undergone the analog-digital conversion before outputting and a demodulated signal obtained by an orthogonal demodulator which provides the combinatory signal with analog-digital conversion before outputting.

3. The transmission device of claim 2, wherein at least one of the distributed signal supplied to the phase/amplitude control section from the modulation signal distributor and a signal supplied to the signal combiner from the second orthogonal modulator has undergone a frequency conversion.

4. The transmission device of claim 3 further comprising a reference table for storing the non-linear distortion compensating data.

5. The transmission device of claim 3, wherein the device includes, instead of the reference table updating section, a compensation coefficient calculator for calculating the non-linear distortion compensating data with a computing equation and a computing coefficient updating section for updating a coefficient of the computing equation.

6. The transmission device of claim 2 further comprising a reference table for storing the non-linear distortion compensating data.

7. The transmission device of claim 2, wherein the device includes,
5 instead of the reference table updating section, a compensation coefficient calculator for calculating the non-linear distortion compensating data with a computing equation and a computing coefficient updating section for updating a coefficient of the computing equation.

10 8. The transmission device of claim 1,
wherein the reference signal is created by a second orthogonal modulator which generates a reference modulation signal by orthogonally modulating the orthogonal base-band signal,

wherein the phase/amplitude control section controls a phase
15 and an amplitude of the reference modulation signal;

wherein the reference table updating section updates the non-linear distortion compensating data by using the orthogonal base-band signal and one of a demodulated signal obtained by an orthogonal demodulator which orthogonally demodulates the combinatory signal
20 undergone the analog-digital conversion and a demodulated signal obtained by an orthogonal demodulator which provides the combinatory signal with analog-digital conversion before outputting.

9. The transmission device of claim 8, wherein at least one of a
25 distributed signal supplied to the phase/amplitude control section from the modulation signal distributor, a signal supplied from the phase/amplitude control section to the signal combiner, and a signal supplied from the second

orthogonal modulator to the signal combiner has undergone a frequency conversion.

10. The transmission device of claim 9 further comprising a reference
5 table for storing the non-linear distortion compensating data.

11. The transmission device of claim 9, wherein the device includes,
instead of the reference table updating section, a compensation coefficient
calculator for calculating the non-linear distortion compensating data with a
10 computing equation and a computing coefficient updating section for
updating a coefficient of the computing equation.

12. The transmission device of claim 8 further comprising a reference
table for storing the non-linear distortion compensating data.
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13. The transmission device of claim 8, wherein the device includes,
instead of the reference table updating section, a compensation coefficient
calculator for calculating the non-linear distortion compensating data with a
computing equation and a computing coefficient updating section for
20 updating a coefficient of the computing equation.

14. The transmission device of claim 1 further comprising:
an orthogonal demodulator for one of orthogonally
demodulating the combinatory signal undergone the analog-digital
25 conversion, then outputting a resultant signal and converting the
combinatory signal undergone orthogonal demodulation, then outputting a
resultant signal; and

an adding circuit for adding the orthogonal base-band signal and the demodulated signal supplied from the orthogonal demodulator,

wherein the reference table updating section updates the non-linear distortion compensating data by using an output from the adding
5 circuit and the orthogonal base-band signal.

15. The transmission device of claim 14, wherein the orthogonal base-band signal to be added to the adding circuit is controlled its amplitude.

10 16. The transmission device of claim 1, wherein the signal combiner combines the distributed signal orthogonally demodulated and the reference signal into a combinatory signal.